ESO 921

OHIO FARM MACHINERY

ECONOMIC COST ESTIMATES FOR 1982*

Revised and Adopted for Ohio

by

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March 1982

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The following information is designed as an aid in estimating farm machinery use costs for 1981. The costs are determined by formula and represent an average cost for a specific piece of machinery. These machinery costs are intended to be average estimates for the agricultural industry.

There are two types of costs associated with owning and operating a machine: Fixed costs, which are incurred whether or not the machine is used, include depreciation, interest, insurance, housing, and taxes. Operating costs, which occur only when the machine is used, include fuel, lubrication, repairs, and labor.

Fixed Costs: Each machine is depreciated for 10 years with a salvage value of 10 percent and investment credit taken at the full 10 percent rate. It is assumed that a piece of equipment purchased new will be used commercially for 10 years even though it may be owned by several people.

Interest and insurance are calculated by multiplying the average investment (new cost plus salvage value divided by 2) times the rates of interest and insurance. Interest and insurance rates are assumed to be 16 percent and .75 percent, respectively. Housing cost is assumed to be 33 cents per square foot of shelter needed per year. There are no property taxes on farm machinery in Ohio.

Formulas Used to Compute Fixed Machinery Costs

$$\text{Depreciation per year} = \frac{\text{purchase price - investment credit - salvage value}}{\text{(years you will use machine)}}$$

$$\text{Interest per year} = \frac{\text{purchase price + salvage value}}{2} \times \text{interest rate}$$

$$\text{Insurance per year} = \frac{\text{purchase price + salvage value}}{2} \times \text{rate}$$

Housing per year = price per square foot x square feet shelter space required

Taxes per year = 0 (no taxes on personal property in Ohio)

Operating Costs: Fuel cost is calculated by multiplying the fuel consumption by the price of fuel, with fuel consumption assumed to be .06 gallons of diesel fuel per horsepower hour. The price of fuel is assumed to be $1.20 per gallon for diesel. All power units, tractors, combines, trucks, etc., are assumed to be diesel powered. An estimate of gasoline consumption can be made by multiplying the diesel fuel consumption by a factor of 1.36. Lubrication cost is assumed to be 10 percent of fuel cost.

The formulas for estimating the repair and maintenance costs necessary to maintain a machine in an operable condition are provided in the 1976 Agricultural Engineer's Yearbook. They are used to estimate total accumulated repair costs according to the accumulated hours of use; the total costs are then broken down to a per hour cost estimate. The amount of annual use of a machine is an estimate of the number of hours a commercial farmer would use that particular machine in one year.

Labor is assumed to be an hourly wage rate, which includes benefits, of $5.20 per hour for unskilled labor and $7 per hour for skilled labor. Labor per acre for an operation such as plowing and disking is calculated by using the work rate on the implement instead of the tractor. Therefore, plows and disks using the same tractor have different per acre labor requirements. Less labor per acre is used in a disking operation that covers more acres per hour than in a plowing operation.

This year minimum tillage planters have been included, reflecting the current interest in minimum or reduced tillage practices in Ohio.

Machinery price increases for 1982 range from 3 percent to 5 percent over 1981. The following table compares the machinery function costs per acre for four selected items from 1978 to 1982.

Machine Function	1978	1979	1980	1981	1982
plow 6-16	$ 6.41	$ 7.72	$10.89	$11.70	$13.28
corn planter 6-30	5.51	6.52	8.20	9.50	10.91
combine small grain	8.13	10.78	14.54	14.61	17.85
combine corn 6-30	13.09	17.46	22.73	24.69	28.98

These cost estimates are not intended to be indicative of everyone's cost, but are intended to be used as a guide in planning the crop operation. Each individual has unique costs because of differences in buying power, repair programs, average annual use, and overall replacement programs.

The following tables provide the 1982 machinery function costs broken down into several categories. Some relevant supporting data also is included.

TILLAGE EQUIPMENT

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST			DIESEL FUEL GAL/ACRE
								TRACTOR	IMPLEMENT	LABOR	
PLOW 2-16	40	1300.00	1.16	139.29	14.36	16.67	3.93	7.68	2.11	4.57	2.07
PLOW 3-16	60	2515.00	1.75	209.45	12.82	22.38	3.96	7.08	2.70	3.04	2.06
PLOW 4-16	75	5713.00	2.33	279.10	13.30	30.94	4.11	6.47	4.56	2.28	1.93
PLOW 5-16	100	7200.00	2.91	348.74	14.01	40.72	4.54	7.58	4.60	1.83	2.06
PLOW 6-16	120	9050.00	3.49	453.82	13.28	46.35	4.54	7.21	4.55	1.52	2.06
PLOW 7-16	140	9650.00	4.07	529.27	12.47	50.77	4.41	7.01	4.16	1.30	2.06
PLOW 8-16	160	11633.00	4.65	604.71	12.14	56.47	4.48	6.62	4.38	1.14	2.06
PLOW 9-18	225	17000.00	5.89	883.64	13.36	78.71	4.87	7.90	4.56	.90	2.29
PLOW 10-18	225	19750.00	6.55	981.82	12.68	83.02	4.55	7.11	4.76	.81	2.06
PLOW 12-18	275	21850.00	7.85	1178.18	12.38	97.21	4.53	7.31	4.39	.68	2.10
CHISEL PLOW 10 FT	140	2928.00	4.36	436.36	9.30	40.60	3.49	6.54	1.55	1.22	1.93
CHISEL PLOW 15 FT	120	3987.00	6.55	654.55	6.04	39.52	2.10	3.84	1.38	.81	1.10
CHISEL PLOW 17 FT	140	4500.00	7.42	741.82	5.94	44.06	2.13	3.85	1.38	.71	1.13
CHISEL PLOW 20 FT	160	7113.00	8.73	872.73	5.95	51.93	2.16	3.53	1.81	.61	1.10
CHISEL PLOW WING 24	225	9306.00	10.47	1047.27	6.86	71.89	2.39	4.45	1.91	.51	1.29
CHISEL PLOW WING 29	250	11911.00	12.65	1265.45	6.70	84.76	2.27	4.26	2.01	.42	1.19
CHISEL PLOW WING 35	300	13265.00	15.27	1527.27	6.22	94.93	2.20	4.01	1.85	.35	1.18
FIELD CULTIVATOR 12	75	2410.00	6.06	727.27	4.16	25.21	1.37	2.48	.80	.88	.74
FIELD CULTIVATOR 18	100	4497.00	8.73	1047.27	4.13	36.06	1.39	2.52	1.00	.61	.69
FIELD CULTIVATOR 28	160	6931.00	13.58	1629.09	3.63	49.26	1.39	2.27	.97	.39	.71
FIELD CULTIVATOR 37	225	10993.00	17.94	2152.73	3.75	67.21	1.44	2.60	1.15	.01	.75
FIELD CULTIVATOR 50	250	18516.00	24.24	2909.09	3.86	93.49	1.30	2.23	1.41	.22	.62
DISK 10 FT	60	3721.00	4.85	484.85	5.32	25.80	1.51	2.55	1.68	1.09	.74
DISK 16 FT	75	7128.00	7.76	775.76	4.62	35.82	1.28	1.94	1.99	.68	.58
DISK 17 FT	75	8841.00	8.24	824.24	4.76	39.27	1.28	1.82	2.30	.64	.55
DISK 20 FT	100	10896.00	9.70	969.70	5.24	50.82	1.48	2.27	2.42	.55	.62
DISK 21 FT	100	12560.00	10.18	1018.18	5.32	54.19	1.47	2.16	2.64	.52	.59
DISK 24 FT	120	14413.00	11.64	1163.64	5.26	61.18	1.51	2.16	2.64	.46	.62
DISK 28 FT	140	16838.00	13.58	1357.58	5.13	69.64	1.50	2.10	2.64	.39	.62
DISK 32 FT	160	19588.00	15.52	1551.52	5.00	77.65	1.51	1.99	2.68	.34	.62
DISK 40 FT	180	25480.00	19.39	1939.39	4.86	94.32	1.43	1.81	2.78	.27	.56
DISK OFFSET 14 FT	140	8670.00	6.11	610.91	8.61	52.61	2.84	4.67	3.07	.87	1.38
DISK OFFSET 16 FT	160	9546.00	6.98	698.18	8.14	56.80	2.82	4.41	2.96	.76	1.38
DISK OFFSET 18 FT	180	10854.00	7.85	785.45	8.14	63.95	2.84	4.47	3.00	.68	1.38
DISK-WING OFFSET 21	225	13615.00	9.16	916.36	8.84	80.98	2.91	5.08	3.18	.58	1.47
DISK-WING OFFSET 23	225	15770.00	10.04	1003.64	8.52	85.47	2.73	4.64	3.35	.53	1.35
LANDPLANE 45-12 FT	180	6600.00	6.40	480.00	9.26	59.25	3.02	5.49	2.89	.88	1.69
LANDPLANE 54-12 FT	225	10976.00	6.40	480.00	12.79	81.87	3.64	7.27	4.64	.88	2.11
LANDPLANE 54-15 FT	225	11334.00	8.00	600.00	10.43	83.44	2.92	5.82	3.91	.70	1.69
LANDPLANE 75-14 FT	225	12040.00	7.47	560.00	11.51	85.92	3.15	6.24	4.52	.75	1.81
SPRINGTOOTH DRAG 30	60	4256.00	16.00	480.00	2.75	44.02	.44	.77	1.63	.35	.22
SPRINGTOOTH DRAG 48	75	7952.00	30.25	1058.91	2.10	63.57	.31	.50	1.42	.19	.15

TRACTORS AND COMBINES (WITHOUT HEADS)

TRACTOR HP	NEW COST	ANNUAL HOURS USE	FIXED COST/HR	VARIABLE COST/ HOUR	TOTAL COST/ HOUR	REPAIR + MAINT. COST/HR	FUEL CONS./ HOUR
40 HP	13920.00	500.00	4.85	4.07	8.92	.90	2.400
60 HP	18437.00	500.00	6.42	5.94	12.36	1.19	3.600
75 HP	22069.00	500.00	7.67	7.36	15.04	1.42	4.500
100 HP	36870.00	550.00	11.61	10.42	22.03	2.50	6.000
120 HP	40925.00	550.00	12.89	12.27	25.16	2.77	7.200
140 HP	45510.00	550.00	14.36	14.17	28.53	3.08	8.400
160 HP	50390.00	600.00	14.57	16.24	30.80	3.56	9.600
180 HP	58050.00	600.00	16.76	18.36	35.12	4.10	10.800
225 HP 4WD	71780.00	500.00	24.88	21.68	46.56	3.86	13.500
250 HP 4WD	85400.00	500.00	29.56	24.39	53.96	4.59	15.000
275 HP 4WD	89050.00	500.00	30.82	26.57	57.39	4.79	16.500
300 HP 4WD	93900.00	500.00	32.49	28.81	61.30	5.05	18.000
320 HP 4WD	102267.00	500.00	35.37	30.85	66.22	5.50	19.200
350 HP 4WD	112950.00	500.00	39.05	33.80	72.84	6.08	21.000
SML COMBINE	52024.00	300.00	30.18	26.45	56.63	18.53	6.000
MED COMBINE	64549.00	300.00	37.47	32.50	69.97	22.99	7.200
LRG COMBINE	76927.00	300.00	44.69	38.88	83.57	27.40	8.700
JMB COMBINE	91520.00	300.00	53.15	48.44	101.59	32.60	12.000

PLANTING EQUIPMENT

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST			DIESEL FUEL GAL/ACRE
								TRACTOR	IMPLEMENT	LABOR	
CORN PLANTER 4-38	40	7899.00	4.83	290.03	9.42	45.53	1.88	1.85	5.89	1.68	.50
CORN PLANTER 6-38	60	11393.00	7.25	435.27	8.46	61.37	1.81	1.70	5.64	1.12	.50
CORN PLANTER 6-30	60	11729.00	5.73	343.64	10.91	62.49	2.34	2.16	7.34	1.42	.63
CORN PLANTER 8-30	75	17281.00	7.64	458.18	11.10	84.78	2.40	1.97	8.07	1.06	.59
POTATO ROW MARKER 4R	120	8000.00	4.98	323.66	11.62	57.86	2.98	5.05	4.82	1.74	1.45
POTATO PLANTER 4 ROW	120	15120.00	3.83	325.58	21.44	82.13	6.08	6.57	10.92	3.95	1.88
BEET PLANTER 12 ROW	100	6944.00	4.67	280.00	11.97	55.86	3.17	4.72	5.39	1.86	1.29
GRAIN DRILL PW 14 FT	40	5692.00	5.57	445.96	6.01	33.52	1.46	1.60	3.02	1.39	.43
GRAIN DRILL PW 16 FT	60	13210.00	6.37	509.67	9.19	58.56	2.41	1.94	6.03	1.22	.57
GRAIN DRILL PW 20 FT	75	14226.00	7.96	637.09	8.07	64.29	2.19	1.89	5.21	.98	.57
GRAIN DRILL PW 24 FT	75	18950.00	9.56	764.51	8.16	77.96	2.18	1.57	5.77	.81	.47
GRAIN DRILL PW 28 FT	100	21455.00	11.15	891.93	8.28	92.29	2.30	1.98	5.60	.70	.54
MIN-TIL PLANTER 4-38	40	9633.00	3.76	225.58	13.73	51.60	2.71	2.37	9.19	2.16	.64
MIN-TIL PLANTER 6-38	60	14778.00	5.64	338.55	12.98	73.23	2.71	2.19	9.35	1.44	.64
MIN-TIL PLANTER 6-30	60	14045.00	4.45	267.27	15.85	70.60	3.33	2.77	11.25	1.82	.81
MIN-TIL PLANTER 8-30	75	20500.00	5.94	356.36	16.17	96.06	3.43	2.53	12.27	1.37	.76
MIN-TIL PLANTER 8-38	75	19500.00	7.42	445.45	12.47	92.55	2.66	2.03	9.35	1.09	.61
MIN-TIL PLANTER 12-3	120	29125.00	8.91	534.55	15.33	136.61	3.45	2.82	11.50	.91	.81

MAINTENANCE EQUIPMENT

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST			DIESEL FUEL GAL/ACRE
								TRACTOR	IMPLEMENT	LABOR	
CULTIVATOR 4-38	40	2577.00	4.91	491.05	4.07	19.98	1.02	1.82	1.15	1.10	.49
CULTIVATOR 6-38	60	3896.00	7.37	736.37	3.57	26.30	1.00	1.68	1.16	.73	.49
CULTIVATOR 6-30	60	3378.00	5.82	581.82	4.32	25.14	1.23	2.12	1.27	.93	.62
CULTIVATOR 8-30	75	4675.00	7.76	775.76	3.95	30.66	1.17	1.94	1.32	.70	.58
CULTIVATOR 12-30	140	7287.00	11.64	1163.64	4.26	49.60	1.45	2.45	1.35	.46	.72
ROTARY HOE 16	40	2865.00	10.86	434.42	2.61	28.31	.45	.82	1.31	.48	.22
POTATO CULT. 4 ROW	75	3752.00	6.13	1286.38	4.12	25.27	1.48	2.45	.79	.88	.73
BEET CULT. 12 ROW	100	6160.00	6.00	360.00	7.98	47.85	2.06	3.67	3.40	.90	1.00
BEET THINNER 6 ROW	100	15900.00	2.10	210.00	29.98	62.96	7.72	10.43	16.02	3.47	2.86
BEET THINNER 12 ROW	120	30000.00	4.20	420.00	22.74	95.50	5.52	5.99	15.01	1.73	1.71
SPRAYER 30 FT	40	3332.00	14.18	1134.55	2.10	29.71	.49	.63	.85	.62	.17
SPRAYER 50 FT	60	4380.00	23.64	2363.64	1.38	32.71	.40	.52	.43	.37	.15
SPRAYER HI PRES 50FT	60	5010.00	23.64	2363.64	1.45	34.29	.42	.52	.56	.37	.15
ANHYDROUS APPLICATOR	120	4334.00	8.91	356.36	6.14	54.73	1.69	2.82	2.54	.78	.81
FERTILIZER SPRDR 40	60	4144.00	38.79	1163.64	1.16	44.98	.18	.32	.66	.18	.09
SHREDDER 12 FT	60	5960.00	4.36	436.36	6.76	29.48	1.58	2.83	2.73	1.19	.83

HARVESTING EQUIPMENT

MACHINE	TRACTOR HP	NEW COST	ESTIMATED ACRES/HR	ANNUAL ACRES USE	TOTAL COST/ ACRE	TOTAL COST/ HOUR	CASH COST/ ACRE	PER ACRE COST			DIESEL FUEL GAL/ACRE
								TRACTOR	IMPLEMENT	LABOR	
SWATHER-COND. 12 FT	---	16547.00	5.45	436.36	9.13	49.82	1.50	0	8.18	.95	.55
SWATHER-COND. 15 FT	---	19356.00	6.82	545.45	8.54	58.25	1.33	0	7.78	.76	.44
SWATHER 12 FT	---	18220.00	5.82	465.45	9.25	53.84	1.48	0	8.36	.89	.52
SWATHER 15 FT	---	19678.00	7.27	581.82	7.92	57.58	1.23	0	7.20	.71	.41
SWATHER 18 FT	---	19835.00	8.73	698.18	6.66	58.16	1.03	0	6.07	.60	.34
SWATHER 20 FT	---	20590.00	9.70	775.76	6.20	60.12	.95	0	5.66	.54	.31
1 TON STACKER	60	8290.00	4.15	829.09	7.44	30.84	2.23	2.98	2.58	1.87	.87
3 TON STACKER	75	17995.00	4.84	1064.00	9.24	44.69	3.07	3.11	4.52	1.61	.93
6 TON STACKER	100	23990.00	5.53	1547.64	10.11	55.90	3.87	3.99	4.72	1.41	1.09
BALER PTO TWINE	40	7900.00	3.78	756.36	6.90	26.11	1.69	2.36	2.49	2.05	.63
ROUND BALER	60	11191.00	4.64	927.27	6.74	31.23	1.99	2.67	2.83	1.24	.78
ROTARY MOWER	40	1800.00	2.73	272.73	6.70	18.28	1.81	3.27	1.53	1.91	.88
RAKE (HYD)	40	2366.00	3.49	698.18	4.93	17.21	1.41	2.55	.89	1.49	.69
FORAGE HARV. 1 ROW	60	11570.00	.95	94.55	46.43	43.90	10.00	13.07	25.14	8.22	3.81
FORAGE HARV. 2 ROW	100	15410.00	1.65	165.45	37.15	61.47	9.12	13.32	19.14	4.70	3.63
FOR HARV 2 ROW SP	---	64786.00	2.04	305.45	53.96	109.87	13.38	0	50.14	3.82	3.63
FOR HAR 3 ROW SP	---	67674.00	3.05	458.18	37.84	115.57	9.65	0	35.29	2.54	2.78
FORAGE BLOWER LG	60	2603.00	1.00	50.00	27.32	27.32	6.54	12.36	9.76	5.20	3.60
CORN PICKER 2-38	40	15291.00	1.49	223.36	26.86	40.00	6.40	5.99	15.66	5.22	1.61
PICKER-SHELLER 2-ROW	60	12947.00	1.49	223.36	26.81	39.92	7.10	8.30	13.29	5.22	2.42
COMBINE SM GRAIN SML	SML	5043.00	4.10	819.39	17.18	70.37	6.83	13.82	1.46	1.90	1.46
COMBINE SM GRAIN MED	MED	5595.00	4.73	945.45	17.85	84.38	7.23	14.80	1.40	1.64	1.52
COMBINE SM GRAIN LGE	LRG	7481.00	6.30	1260.61	15.90	100.19	6.53	13.26	1.40	1.23	1.38
COMBINE SOYBEANS SML	SML	6771.00	3.58	716.97	20.20	72.41	7.95	15.80	2.23	2.17	1.67
COMBINE SOYBEANS MED	MED	7260.00	4.14	827.27	20.87	86.32	8.39	16.92	2.07	1.88	1.74
COMBINE SOYBEANS LGE	LRG	8919.00	4.96	992.73	20.53	101.90	8.38	16.84	2.13	1.57	1.75
COMBINE CORN 3-30 SM	SML	8875.00	1.77	354.55	43.22	76.61	17.43	31.94	6.89	4.38	3.38
COMBINE CORN 2-38 SM	SML	5575.00	1.49	297.82	48.42	72.10	19.64	38.03	5.17	5.22	4.03
COMBINE CORN 3-38 SM	SML	9408.00	2.25	449.09	34.44	77.34	13.88	25.22	5.76	3.46	2.67
COMBINE CORN 4-38 MD	MED	12084.00	2.99	598.47	31.54	94.37	12.89	23.38	5.56	2.60	2.41
COMBINE CORN 4-30 MD	MED	11637.00	2.60	520.00	36.05	93.72	14.74	26.91	6.15	2.99	2.77
COMBINE CORN 6-30 LG	LRG	15780.00	3.90	780.00	28.98	113.04	12.00	21.43	5.56	1.99	2.23
COMBINE CORN 8-30 LG	LRG	20527.00	4.73	945.45	25.29	119.57	10.40	17.68	5.97	1.64	1.84
COMBINE CORN 12-30 J	JMB	33285.00	7.09	1418.18	20.87	147.96	9.19	14.33	6.43	.11	1.69
POTATO HRVSTR. 2 ROW	120	24650.00	2.49	323.66	33.60	83.65	7.37	10.11	15.74	7.76	2.89
BEET LIFTER 3 ROW	100	28577.00	2.60	208.00	37.45	97.36	6.24	8.47	25.98	2.99	2.31
BEET LIFTER 4 ROW	100	29335.00	3.47	277.21	28.65	99.27	4.73	6.36	20.05	2.24	1.73
BEET LIFTER 6 ROW	120	30352.00	5.20	416.00	20.19	104.98	3.55	4.84	13.86	1.49	1.38
BEET TOPPER 3 ROW	60	8960.00	3.20	256.00	12.94	41.39	2.63	3.86	6.89	2.19	1.13
BEET TOPPER 4 ROW	75	10640.00	4.26	341.18	11.32	48.28	2.42	3.53	6.15	1.64	1.06
BEET TOPPER 6 ROW	100	11760.00	6.40	512.00	9.09	58.18	2.14	3.44	4.55	1.09	.94
BEET WAGON 8 TON	75	7392.00	3.47	277.21	10.84	37.58	2.33	4.34	5.00	1.50	1.30

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